

IN THE CLAIMS:

- 1 1. (Canceled)
- 1 2. (Previously Presented): The method of claim 63, wherein the storage time is based on
2 one or more of: an actual time, a time interval, and an event.
- 1 3. (Previously Presented): The method of claim 61, further comprising:
2 prior to detecting changed locations, generating a baseline image, where the baseline
3 image includes at least the one or more data files.
- 1 4. (Original): The method of claim 3, wherein generating a baseline image includes:
2 generating one or more of: a volume image, a file image, and a snapshot image.
- 1 5. (Previously Presented): The method of claim 61, wherein detecting changed locations
2 includes:
3 at a time prior to the storage time,
4 generating a baseline image of at least the one or more data files, and,
5 using one or more data integrity procedures to generate a summary of the
6 baseline image;
7 thereafter,
8 generating a second image of at least the one or more data files, and,
9 using the one or more data integrity procedures to generate a summary of the
10 second image; and,
11 based on the baseline summary and the second summary, determining whether the
12 one or more data files includes changed locations.
- 1 6. (Original): The method of claim 5, wherein the one or more data integrity procedures
2 include one or more of: a cyclic redundancy check procedure and an MD5 procedure.

1 7. (Canceled):

1 8. (Canceled)

1 9. (Canceled)

1 10. (Previously Presented): The method of claim 61, wherein storing the contents includes:
2 selecting at least one memory to store the contents.

1 11. (Original): The method of claim 10, wherein selecting at least one memory includes:
2 selecting the at least one memory to be distinct from a previously selected memory
3 associated with a prior storage time.

1 12. (Canceled)

1 13. (Previously Presented): The method of claim 63, wherein providing the associations
2 includes:
3 generating one or more indexes to associate: the stored contents, the respective
4 storage times, the respective changed locations, and one or more respective file identifiers.

1 14. (Original): The method of claim 13, wherein the one or more indexes include:
2 a first index to the changed locations based on the one or more file identifiers, and
3 a second index to the stored contents based on the changed locations.

1 15. (Previously Presented): The method of claim 61, further comprising:
2 using the stored contents to create a version of a selected one of the one or more data
3 files.

1 16. (Previously Presented): The method of claim 15, wherein using the stored contents to
2 create a version includes:

3 for each of one or more storage times associated with the version: querying one or
4 more indexes that associate the stored contents, the respective storage times, the respective
5 changed locations, and one or more respective file identifiers, to identify stored contents and
6 respective changed locations associated with the selected data file, and

7 combining the identified stored contents with data from a baseline image associated
8 with the selected data file.

1 17. (Previously Presented): : The method of claim 16, wherein querying includes:

2 determining that the changed locations are the same for two or more different storage
3 times, and,

4 identifying the stored contents of the changed locations associated with the latest of
5 the two or more different storage times.

1 18. (Previously presented) The method of claim 63, further comprising:

2 receiving from a first server a request to create a version of a selected one of the one
3 or more data files, and

4 based on the request:

5 for each of one or more storage times associated with the version: querying
6 one or more indexes that associate the stored contents, the respective storage times, the
7 respective changed locations, and one or more respective file identifiers, to identify stored
8 contents and respective changed locations associated with the selected data file, and

9 providing the identified stored contents and respective changed locations to
10 the first server.

1 19. (Original): The method of claim 18, further comprising:

2 at the first server, combining the identified stored contents with data from a baseline
3 image associated with the selected data file.

1 20. (Previously Presented): The method of claim 63, further comprising:
2 at a coalescence time, coalescing:
3 two or more stored contents associated with the same file and two or more
4 different storage times,
5 the respective changed locations associated with the two or more coalesced
6 contents, and
7 one or more indexes to associate the coalesced contents, the respective
8 coalesced changed locations, an identifier of the file with which those contents are
9 associated, and the latest of the two or more different storage times.

1 21. (Previously Presented): The method of claim 63, further comprising:
2 at a coalescence time, coalescing:
3 two or more stored contents associated with the same file and the same
4 storage time,
5 the respective changed locations associated with the two or more coalesced
6 contents, and
7 one or more indexes to associate the coalesced contents, the respective
8 coalesced changed locations, an identifier of the file with which those contents are
9 associated, and the same storage time.

1 22. (Original): The method of claim 21, wherein the coalescence time is based on one or
2 more of: an actual time, a time interval, and an event.

1 23. (Original): The method of claim 22, wherein the event includes an event based on an
2 available storage capacity of a storage medium.

1 24. (Canceled)

1 25. (Canceled)

1 26. (Canceled)

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1 34. (Canceled)

1 35. (Canceled)

1 36. (Canceled)

1 37. (Canceled)

1 38. (Previously Presented): The storage medium of claim 66, wherein the storage time is
2 based on one or more of: an actual time, a time interval, and an event.

1 39. (Canceled)

1 40. (Previously Presented): The storage medium of claim 64, wherein the instructions to
2 store the contents include instructions to select at least one memory to store the contents.

1 41. (Previously Presented): The storage medium of claim 40, wherein the instructions to
2 select at least one memory include instructions to select the at least one memory to be
3 distinct from a previously selected memory associated with a prior storage time.

1 42. (Canceled)

1 43. (Previously Presented): The storage medium of claim 66, wherein the instructions to
2 provide the associations include instructions to generate one or more indexes to associate:
3 the stored contents, the respective storage times, the respective changed locations, and one
4 or more respective file identifiers.

1 44. (Previously Presented): The storage medium of claim 43, wherein the one or more
2 indexes include:
3 a first index to the changed locations based on the one or more file identifiers, and
4 a second index to the stored contents based on the changed locations.

1 45. (Previously Presented): The storage medium of claim 64, further comprising
2 instructions to use the stored contents to create a version of a selected one of the one or more
3 data files.

1 46. (Previously Presented): The storage medium of claim 45, wherein the instructions to
2 use the stored contents to create a version include instructions to:
3 for each of one or more storage times associated with the version: query one or more
4 indexes that associate the stored contents, the respective storage times, the respective
5 changed locations, and one or more respective file identifiers, to identify stored contents and
6 respective changed locations associated with the selected data file, and

7 combine the identified stored contents with data from a baseline image associated
8 with the selected data file.

1 47. (Previously Presented): The storage medium of claim 64, further comprising
2 instructions to receive from a first server a request to create a version of a selected one of the
3 one or more data files, and

4 based on the request:

5 for each of one or more storage times associated with the version: query one
6 or more indexes that associate the stored contents, the respective storage times, the
7 respective changed locations, and one or more respective file identifiers, to identify stored
8 contents and respective changed locations associated the selected data file, and

9 provide the identified stored contents and respective changed locations to the
10 first server.

1 48. (Previously Presented): The storage medium of claim 47, further comprising
2 instructions to, at the first server, combine the identified stored contents with data from a
3 baseline image associated with the selected data file.

1 49. (Canceled)

1 50. (Previously Presented): The system of claim 69, wherein the storage time is based on
2 one or more of: an actual time, a time interval, and an event.

1 51. (Canceled)

1 52. (Previously Presented): The system of claim 67, wherein at least one said agent selects
2 at least one memory to store the contents.

1 53. (Previously Presented): The system of claim 52, wherein at least one said memory
2 selected by at least one said agent is distinct from a previously selected memory associated
3 with a prior storage time.

1 54. (Canceled)

1 55. (Previously Presented): The system of claim 69, wherein at least one said agent
2 provides the associations by generating one or more indexes to associate: the stored
3 contents, the respective storage times, the respective changed locations, and one or more
4 respective file identifiers.

1 56. (Original): The system of claim 55, wherein the one or more indexes include:
2 a first index to the changed locations based on the one or more file identifiers, and
3 a second index to the stored contents based on the changed locations.

1 57. (Previously Presented): The system of claim 69, further configured to use the stored
2 contents to create a version of a selected one of the one or more data files.

1 58. (Previously Presented): The system of claim 57, wherein the system is configured to
2 use the stored contents to create a version include processor instructions by:
3 for each of one or more storage times associated with the version: querying one or
4 more indexes that associate the stored contents, the respective storage times, the respective
5 changed locations, and one or more file respective identifiers, to identify stored contents and
6 respective changed locations associated with the selected data file, and
7 combine the identified stored contents with data from a baseline image associated
8 with the selected data file.

1 59. (Previously Presented): The system of claim 69, further configured to receive
2 from a first server a request to create a version of a selected one of the one or more data
3 files, and

4 based on the request:

5 for each of one or more storage times associated with the version: query one
6 or more indexes that associate the stored contents, the respective storage times, the
7 respective changed locations, and one or more respective file identifiers, to identify stored
8 contents and respective changed locations associated the selected data file, and

9 provide the identified stored contents and respective changed locations to the
10 first server.

1 60. (Previously Presented): The system of claim 59, further configured to, at the first
2 server, combine the identified stored contents with data from a baseline image associated
3 with the selected data file.

1 61. (Currently Amended): For maintaining in a backup storage system information from
2 which a set of source files stored on a source storage system can be restored, a method that
3 includes, for each of a sequence of storage times:

4 A) ~~by monitoring writes to files in the source storage system since the previous~~
5 ~~storage time, dynamically~~ identifying locations in the source storage system
6 where changes have been made since ~~that the~~ previous storage time; and

7 B) in response to thus identifying locations, storing in the backup storage
8 system:

- 9 i) contents that at that storage time occupy locations thus identified; and
10 ii) associations of those contents with those locations.

1 62. (Previously Presented): A method as defined in claim 61 wherein the associations of
2 the contents with the locations associate the contents with the files in the source storage
3 system to which those contents were written.

63. (Previously Presented): A method as defined in claim 62 further including providing in the backup storage system associations between the contents there stored and the storage times for which those contents were stored.

64. (Currently Amended): For configuring a computer system that includes a source storage system and a backup storage system to maintain in the backup storage system information from which a set of source files stored on the source storage system can be restored, a storage medium containing instructions readable by the computer system to configure the computer system to, for each of a sequence of storage times:

A) ~~by monitoring writes to files in the source storage system since the previous storage time, dynamically~~ identify locations in the source storage system where changes have been made since ~~that the~~ previous storage time; and

B) in response to thus identifying locations, store in the backup storage system:

- i) contents that at that storage time occupy locations thus identified; and
- ii) associations of those contents with those locations.

65. (Previously Presented): A storage medium as defined in claim 64 wherein the associations of the contents with the locations associate the contents with the files in the source storage system to which those contents were written.

66. (Previously Presented): A storage medium as defined in claim 65 wherein the instructions further configure the computer system to provide in the backup storage system associations between the contents there stored and the storage times for which those contents were stored.

1 67. (Currently Amended): A computer system that includes a source storage system and a
2 backup storage system and, to maintain in the backup storage system information from
3 which a set of source files stored on the source storage system can be restored, is configured
4 for execution thereon of agents that together, for each of a sequence of storage times:

5 A) ~~by monitoring writes to files in the source storage system since the previous~~
6 ~~storage time, dynamically~~ identify locations in the source storage system
7 where changes have been made since ~~that the~~ previous storage time; and

8 B) in response to thus identifying locations, store in the backup storage system:

- 9 i) contents that at that storage time occupy locations thus identified; and
10 ii) associations of those contents with those locations.

1 68. (Previously Presented): A system as defined in claim 67 wherein the associations of
2 the contents with the locations associate the contents with the files in the source storage
3 system to which those contents were written.

1 69. (Previously Presented): A system as defined in claim 68 wherein at least one said agent
2 provides in the backup storage system associations between the contents there stored and the
3 storage times for which those contents were stored.